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Re

REPUBLIC SHEETS

architectural applications of Stainless Steel...

REPUBLIC STEEL

GENERAL OFFICES : CLEVELAND 1, OHIO

REPUBLIC STAINLESS STEELS

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What is Republic Enduro® Stainless Steel?

ENDURO is the trade name given to the family of stainless steels produced by Republic Steel Corporation, the world's largest maker of alloy and stainless steels. There are more than 35 standard types of stainless. Each type fills a special requirement for special properties or combination of properties such as corrosion, strength or heat resistance, and machining or welding. However, only a few of these types are commonly used in architecture.

Essentially, stainless is an alloy of iron with chromium; or iron with chromium and nickel. Chromium in the amount of 11½% or more makes it stainless. Small amounts of alloying elements, such as titanium, columbiun or molybdenum, may be added to attain better heat-resistance, corrosion-resistance or welding stability.

No other metal employed by the building industry has such a remarkable ability to resist corrosion and oxidation. Properly selected and applied, it is rust-proof and will not tarnish when exposed to the atmosphere.

Stainless steel is easily cleaned and kept sanitary. Stronger than ordinary steel, it is well suited for applications where high strength and high corrosion-resistance are necessary. Stainless offers high resistance to scaling (oxidation) at high temperatures. It can be readily fabricated with standard metal fabricating equipment and processes.

specify REPUBLIC Stainless Steel because . . .

IT IS CORROSION RESISTANT

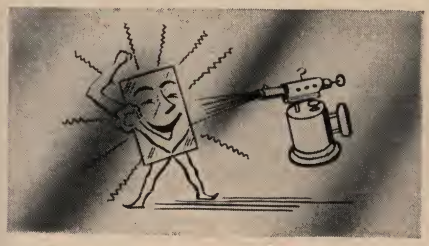
Stainless resists corrosive industrial atmosphere, grime, soot, and attack by most acids and chemicals. It requires no special surface treatment.

IT BLENDS WELL

The neutral, silvery color of stainless is ideal for blending with other building materials such as porcelain enamel, masonry, wood and glass.

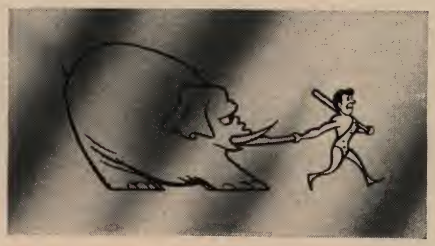
IT IS EASY TO FABRICATE

Stainless can be readily fabricated with standard shop equipment and only slightly altered shop techniques. Thousands of sheet metal shops have had excellent results in the fabrication of this metal.



IT IS HEAT RESISTANT

Stainless retains its high strength even at elevated temperatures. This makes it an ideal material for combustion chambers and processing equipment involving high temperatures.



IT IS STRONG

Stainless is a high-strength alloy which often permits the use of lighter sections. This high strength-weight ratio is particularly advantageous for equipment where weight is an important factor in design such as in transportation equipment.

IT IS PERMANENT

When stainless is specified, worries end, because it lasts, and lasts. Hundreds of installations made 20 to 30 years ago are as good as new today!

IT IS ATTRACTIVE

The natural, lustrous appearance of stainless imparts a quality of beauty, dignity and richness to buildings and homes on which it is used and it stays bright for a lifetime.

IT IS EASY TO CLEAN

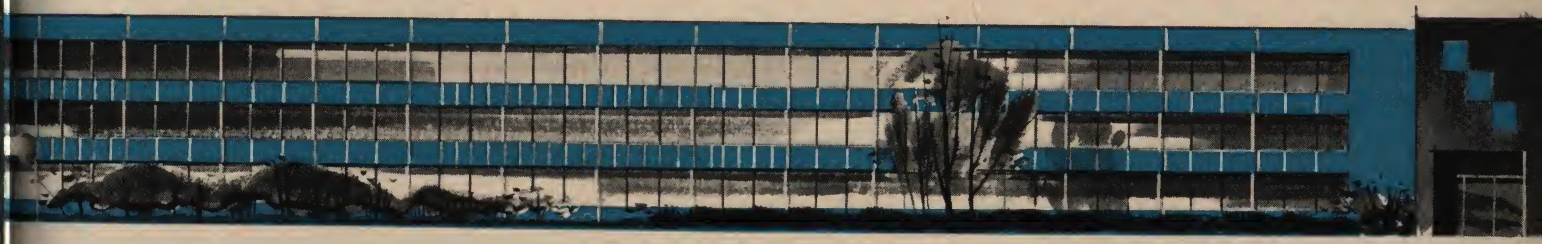
The tough, hard, smooth surface prevents grime and dirt from gaining a foothold. A wipedown with detergent or soap and water is usually all that's required to leave a bright-as-new appearance.

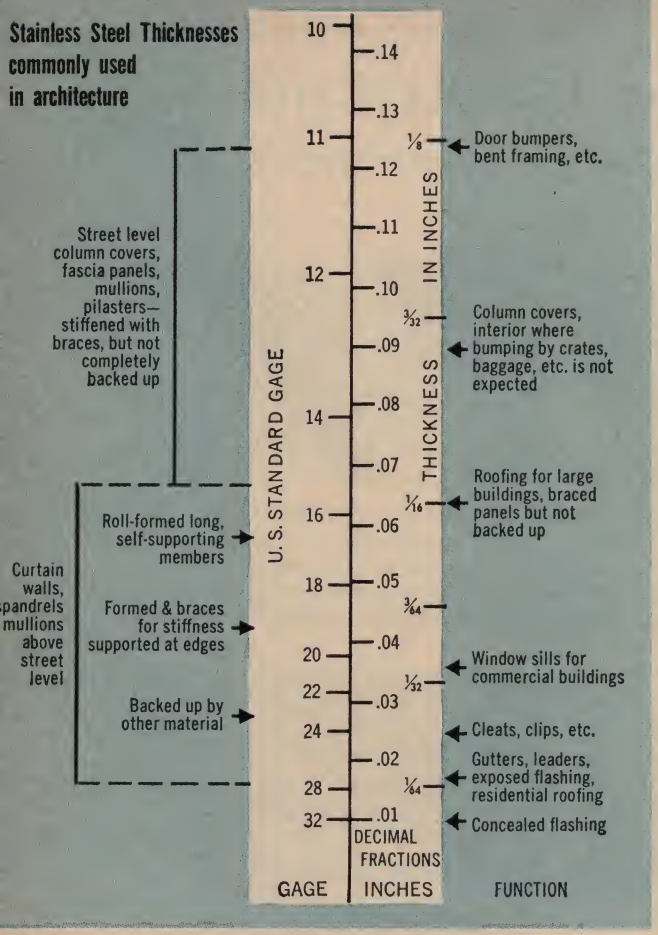
IT IS THRIFTY

Long-range planners look beyond initial costs. When repairs and upkeep are taken into account, stainless often proves to be the least expensive material because maintenance costs are negligible.

these features will appeal to your clients—

Whether your next job requires the functional use of stainless steel, its decorative appeal, or a combination of both, your clients will readily appreciate the benefits from its use. No material now available to the building industry has as many desirable properties as does stainless steel. Few materials have as much sales appeal.





how to specify stainless steels . . .

When specifying stainless steel, the architect should consider: conditions of service and design requirements such as types of stainless gage (this page), form (page 16) and finishes (page 15). To insure that the proper stainless is specified it is recommended that the architect take advantage of the specialized knowledge and assistance of Republic's metallurgists.

Specifications for finishes will depend upon whether reflectivity

Several types of stainless steel now used

These are Types 301, 302, 316, 201, 202 and 430. Types 303 and 430F are used for bolts, nuts, screws and other hardware. Type 302 contains approximately 18% chromium and 8% nickel and is the all-purpose type known as 18-8. This alloy has high all-around corrosion resistance, especially under atmospheric exposure, making it particularly well suited for exterior applications.

Type 301 is a variation of Type 302, having approximately 17% chromium and 7% nickel, and is slightly less corrosion resistant than Type 302. Type 301 can be cold rolled to high tensile strengths for special applications. Type 316 offers more corrosion resistance than Types 301 and 302 because of the addition of

ARCHITECTURAL STAINLESS STEEL TYPES

	Comparative Architectural Metals		General Purpose			High Strength or Special Purpose		Maximum Corrosion Resistance	Free Machining	
	Galvanized Steel C-1010	Aluminum 3003-H14	Type 302	Type 202	Type 430	Type 301	Type 201	Type 316	Type 303	Type 430F
PRINCIPAL ALLOYING ELEMENTS (Per Cent)										
Carbon	0.15 Max.	—	0.15 Max.	0.15 Max.	0.12 Max.	0.15 Max.	0.15 Max.	0.08 Max.	0.015 Max.	0.12 Max.
Chromium	—	—	17.0-19.0	17.0-19.0	14.0-18.0	16.00-18.00	16.0-18.0	16.00-18.00	17.00-19.00	14.00-18.00
Nickel	—	—	8.0-10.0	4.0- 6.0	—	6.00- 8.00	3.5- 5.5	10.00-14.00	8.00-10.00	—
Other	—	1.0-1.5 Mn	—	7.5-10.0 Mn	—	—	5.5- 7.5 Mn	2.00- 3.00 Mo	.015 Min. S or Se	0.15 Min. S or Se
Balance	Fe	Ae	Fe	Fe	Fe	Fe	Fe	Fe	Fe	Fe
TYPICAL MECHANICAL PROPERTIES (Annealed)										
Yield Strength (psi)	30,000	20,000	40,000	55,000	45,000	(Note) 40,000	(Note) 55,000	40,000	35,000	55,000
Tensile Strength (psi)	58,000	22,000	90,000	105,000	75,000	110,000	115,000	90,000	90,000	80,000
Elongation in 2"	30	8	50%	55%	25%	60%	55%	50%	50%	25%
Hardness	RB 65	R-15T 60	RB 85	RB 90	RB 80	RB 85	RB 90	RB 85	160 BHN	170 BHN
OTHER PROPERTIES (Annealed)										
Modulus of Elasticity (Psi in Tension)	29 x 10^6	10 x 10^6	28 x 10^6	28 x 10^6	29 x 10^6	28 x 10^6	28 x 10^6	28 x 10^6	28 x 10^6	29 x 10^6
Density (lb./cu. in.)	0.28	0.10	0.29	0.28	0.28	0.29	0.28	0.29	0.29	0.28
Mean Coefficient Expansion per degree F (32-212° F)	6.7 x 10^{-6}	12.7 x 10^{-6}	9.6 x 10^{-6}	10.2 x 10^{-6}	5.8 x 10^{-6}	9.4 x 10^{-6}	8.8 x 10^{-6}	8.9 x 10^{-6}	9.6 x 10^{-6}	5.8 x 10^{-6}
Thermal Conductivity (BTU/hr./sq. ft./degree F/ft.)	34	92	9.4	9.4	15.1	9.4	9.4	9.4	9.4	15.1
Melting Range (degree F)	2765-2775	1190-1210	2550-2590	2575-2625	2600-2750	2550-2590	2575-2625	2500-2550	2550-2590	2600-2750
Scaling Temp. Intermittent Service (degree F)	1200	—	1600	1500	1500	1600	1500	1600	1500	1500

Note—May be cold worked to much higher mechanical strength properties for special applications. For example, Types 301 and 201 sheet and strip may be cold worked to minimum yield strengths of 75,000 psi (¼ Hard), 110,000 psi (½ Hard), 135,000 psi (¾ Hard) and 140,000 psi (Full Hard).

or non-reflectivity is desired and whether the stainless should match or contrast with other materials. When a bright finish is required, a 2-B or No. 4 finish polished sheet is generally specified; for a softer, or satin finish, No. 6 finish is frequently used. For extremely high reflectivity, a No. 8 mirror or No. 7 finish is sometimes used. No. 2-B and No. 4 mill-finish sheets in a wide variety of gages and sizes are ordinarily stocked by warehouses. Other finishes usually must be obtained from the mill. In many cases, fabricators start with a No. 2-B mill-finish and then polish to any desired finish after fabrication is complete. After forming, stainless should normally be cleaned with a dilute, warm nitric acid solution to remove iron particles, which might be picked up from rolls, dies or tools.

for architectural purposes . . .

2-3% molybdenum.

The chromium-nickel-manganese Types 201 and 202 stainless steel contain 6-8% manganese to substitute for some of the nickel contained in the higher-nickel-content 300 Series to achieve similar mechanical and corrosion-resistant properties.

Type 430 is a straight-chromium grade of stainless and contains 14-18% chromium with no nickel. This type has somewhat lower corrosion resistance than the 300 or 200 Series. While it is sufficiently resistant for some exterior applications, it is principally employed for interior use. It does not have the ductility of Type 302 or 202. Where severe forming is required, Type 302 or 202 should be used. Welded joints in Type 430 have a tendency toward embrittlement.

Types 303 and 430F are suitable for bolting and other hardware where machinability is of prime importance.*

The selection of the proper type and finish of stainless for each application is highly important if long range economy is to be realized. Each prospective application requires special consideration and a Republic representative should be consulted. Metallurgical assistance is strongly recommended.

**Type 303 is more corrosion-resistant than type 430F.*

Stainless resists corrosion . . .

The resistance of stainless steels to some of the more common foods, acids and chemicals is shown in the table at right. This is a partial table and only three types of stainless are listed. More complete data is available upon request.

Symbols represent the approximate relative corrosion-resistance as follows: I—Fully Resistant; II—Satisfactorily Resistant; III—Fairly Resistant; IV—Slightly Resistant; V—Not Resistant.

Because conditions of service cannot always be duplicated in the laboratory, it is advisable wherever possible, to subject samples to actual operating conditions for the most accurate prediction of service life.

Substance and Conditions	Temp. °F.	Type 316	Type 302	Type 430
Alcohol Ethyl	70	I	I	I
	Boiling	I	I	I
Alcohol Methyl	70	I	I	I
	150	III	*III	*III
Ammonia All Concentrations	70	I	I	I
Beer		I	I	—
Benzene	70	I	I	I
Benzol	Hot	I	I	I
Benzoic Acid	70	I	I	I
Blood (Meat Juices)	Cold	I	*I	*I
Borax 5%	Hot	I	I	I
Boracic Acid 5%	Hot or Cold	I	I	I
Carbonated Water	Hot or Cold	I	I	I
Carbon Tetrachloride Pure	70	I	I	I
Chlorinated Water Saturated	70	**II	**III	IV
Developing Solutions	70	I	I	I
Epsom Salts	Hot or Cold	I	I	I
Ether	70	I	I	I
Fruit Juices	70	I	I	I
Concentrated Citric	70	II	V	V

Substance and Conditions	Temp. °F.	Type 316	Type 302	Type 430
Hydrogen Peroxide	70	I	†I	†I
Ink	70	I	†I	—
Iodine	70	IV	V	V
Kerosene	70	I	I	I
Lard	70	I	I	I
Linseed Oil	70	I	I	I
Mayonnaise	70	I	*I	***
Naphtha	70	I	I	I
Nitric Acid 20% Solution	70	I	I	I
Concentrated	70	I	I	I
Oils, Vegetable, Mineral	Hot or Cold	I	†I	†I
Paraffine	Hot or Cold	I	I	I
Sea Water		I	*I	*III
Sewage		†I	†I	***
Sulphuric Acid 5%	Boiling	III	V	V
Concentrated	70	I	I	I
Tannic Acid	70	I	I	I
Varnish	70	I	I	I
Vegetable Juices		I	I	***
Vinegar	Hot	I	I	***

*Subject to pitting at air line or when allowed to dry.
**Not recommended for standing baths.
***Consult Republic metallurgists.
†May attack when sulphuric acid is present.

atmospheric corrosion

Stainless steel offers more economical protection against most types of atmospheric corrosion than other commercially available metals.

Resistance of stainless steel to atmospheric corrosion depends on an invisible oxide film which is formed on the metal when exposed to air. Accumulation of dirt or other substances should be avoided so that air is not excluded.

Architectural components for atmospheric environments should be designed so that moisture or dirt cannot collect. Rounded corners and smooth contours should be used to prevent the accumulation of liquids or solid matter. Butt or flush-welded joints are preferred over lap welded joints to eliminate crevices where foreign materials may lodge.

Nickel-bearing stainless steels, such as Types 302 and

301 or 202 and 201, provide satisfactory corrosion resistance for most exterior applications. For most interior decorative applications, Type 430 gives adequate service. Type 316 is frequently specified in marine atmospheres for added corrosion resistance to salty atmosphere.

Stainless steels do not depend on treated surface protection or coatings to provide adequate corrosion resistance. Some non-ferrous metals are commonly anodized or lacquered to give satisfactory service.

Such extra surface protection is not permanent. To maintain the bright appearance of these non-ferrous metals, considerable maintenance and cleaning are required.

Stainless is a solid metal throughout. It is often the most economical metal to specify, especially when maintenance costs are considered because it does not require extra surface protection.

Atmospheric corrosion varies considerably due to local conditions such as excessive moisture, salty air, heat, or chemically laden atmospheres. In cases of doubt, we suggest that our metallurgists be consulted before a final decision is made.

Stainless Steels have many architectural applications

There are MANY architectural applications for stainless—In addition to its outstanding corrosion resistance, an important advantage of stainless steel is the fact that it blends with other materials. Its gleaming, lustrous surface blends well with such materials as glass, porcelain enamel, plastics, non-ferrous metals, wood, brick, marble, stone and concrete. The following list includes some of the ever-expanding architectural applications of stainless steel—both interior and exterior.

Air conditioning ducts, dryers, outlets
Air conditioning units, washers, water cooling tanks
Anchors and anchor fastenings
Athletic equipment
Autoclaves
Awning boxes, hardware, piping
Awnings
Backbars
Balconies
Balustrades
Bar and bar fixtures
Barbecue equipment
Baseboards
Basins
Bathtubs
Beacons
Billboards
Bins
Boiler and accessories
Booths and seats
Booths, information
Bulletin boards
Cabinets
Canopies
Cavity wall ties
Ceilings
Checkers' stations
Chimney liners
Church crosses
Chutes
Clock faces and hands
Coffee urns and stands
Column coverings
Columns
Conductor pipes
Controls
Conveyors
Coolers, bottle
Copings
Corner guards
Cornerstone record containers
Cornices
Counter fronts, tops
Curtain wall panel
Decks
Deposit chutes
Desks and form racks
Directories
Dishwashers
Dispensers, paper, towel
Display cases, shelves
Domes
Door frames, handles, hardware
Doors, garage, hollow, revolving, screen and storm, swinging
Downspouts
Drainboards
Drinking fountains
"Drive In" service facilities
Dryers
Ducts
Dumbwaiters
Dust collectors
Elevator cab controls and dials, cab doors, cab linings
Elevator control boards and dials
Elevator door frames, doors
Escalators
Examining and operating tables
Exhaust systems
Expansion joints
Facades
Facia
Facings
Fans
Fences
Files
Filters
Fireplace accessories
Fireplaces
Flagpoles
Flashing, cap, through wall
Floor treads
Flues
Flower boxes
Folding gates
Food warmers
Foot rails
Furnace combustion chamber linings, covers
Gates
Gratings
Gravel stops
Grilles
Gutters
Guy wires
Handles
Handrails
Hangers
Hatracks
Hips
Hoods
Hydrotherapy tanks
Ice guards
Incinerators
Insect screens
Instruments
Kitchen equipment
Ladders and anchors
Lamp posts
Laundry equipment
Ledges
Letters
Lighting fixtures
Lightning arrestors
Lockers
Locks
Louvers
Mail boxes
Mail chutes
Marquees and hangers
Masts
Mirror frames
Mouldings
Mullions
Murals
Newels
News stands
Numerals
Ovens
Oxygen cabinets
Paneling
Parapet walls
Partitions
Pediments
Penthouses
Picture frames
Pigeon proofing
Piers
Pilasters
Pipe and fittings
Plaques
Plate glass frames
Plates, kick, name, push, receptacle
Platforms
Playground equipment
Pools
Print washers
Processing tanks
Pump shafts
Push bars
Racks
Racks, checkroom, coat, dish and tray, towel
Radiator enclosures
Railings
Ranges (stoves)
Reflective insulation
Reflectors
Refrigerators
Roofs
Roof drains, flanges, ventilators
Safety deposit boxes
Sand urns
Sashes
Screens
Scupper linings
Seats
Seat backs
Service tables
Sheathing
Shelves
Shower heads, stalls
Shutters
Siding
Sign structures
Signs
Sinks
Skylights
Smokestacks
Sneeze guard mouldings
Snow guards
Snow melters
Soap dishes and dispensers
Soda fountains
Soffits
Solar grilles
Solar shades (louvers)
Spandrels
Spires
Stairs
Stair nosings, rails, treads
Stanchions
Stand pipe outlets
Statuary
Steam kettles
Steam tables and inserts
Steamers
Sterilizers
Strainers
Swimming pools
Switchboards
Switch box doors
Switch plates
Tables
Tablets
Tanks
Telephone booths
Telephone directory racks and binders
Television antennae
Tellers' window ledges
Termite shields
Terra cotta ties
Terrazzo strips
Thresholds
Ticket booths
Towers, clock, cooling, radio and television
Transoms
Tray slide rails
Trays
Tubs
Umbrella stands
Valleys
Valves
Vapor barriers
Vault doors
Vault linings
Venetian blinds
Ventilators, glass block
Vent guards
Vents
Wainscotting
Wall tiles
Walls
Wash fountains
Waste containers
Watercloset bases
Water coolers
Weatherstripping
Weather vanes
Window boxes, hardware, sills
Window washers' anchor bolts and hooks
Window washers' scaffold guides
Windows, casement, double hung, glass block, pivoting, projecting, screen and storm, show

fabrication is no problem . . .

REPUBLIC STAINLESS STEEL 6c Re

Most sheet metal shops have recognized the advantages of stainless and have become experienced in its fabrication. As a result, it is no problem today to locate a shop that can turn out first-class stainless work to the architect's specifications. Stainless is not difficult to handle. It can be fabricated on standard equipment found in most sheet metal shops. With a little care and experience, any good fabricator can turn out excellent stainless work requiring shearing, brake forming, soldering, cutting, welding, joining or polishing.

Complete, up-to-date information on stainless fabrication is available in two booklets, "How to Fabricate Republic Enduro Stainless Steel" and "Welding Republic Enduro Stainless Steels." Other valuable data is contained in "Architectural Uses of the Stainless Steels," "Stainless Steels for Store Fronts and Building Entrances," and "How and Where to Specify Stainless Steel in Architecture."

Information on where to obtain products and services for stainless steel is available in a "Buyer's Guide for Stainless Steel Products and Services" available on request.

First Congregational Christian Church, Greensboro, N. C. Stainless Steel spire fabricated of types 302 and 304 by the Truitt Manufacturing Co., Greensboro, N. C.

Unusually handsome railing treatment in stainless steel to harmonize with the stainless windows and mullions.

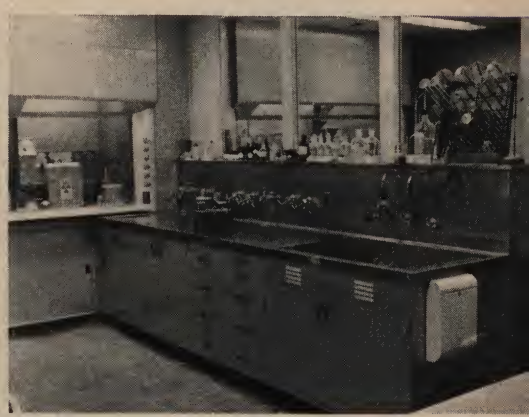
Republic services for architects

To assist the architect in obtaining the best possible use of stainless steel, Republic offers the services of its Metallurgical and Engineering Departments with completely equipped laboratories and staff specialists. The experience of the members of this staff includes contact with practically every known application and method of fabrication of stainless steel. They will be glad to assist the designer in the scientific selection of the proper types, finishes and fabricating techniques for stainless.

Any of the sales offices listed on the back cover will be glad to cooperate with the architect and to suggest fabricators who are experienced and qualified to handle specialized work. They will also assist on questions regarding specifying, detailing and installation. Please call the sales office or distributor nearest you or write to Republic Steel Corporation, Cleveland 1, Ohio.

This sanitary stainless steel kitchen equipment will always be easy to clean and will be kept clean. Note the stainless acoustic ceiling panels.

Dessert counter, salad station, sandwich counter and steam table in Stouffer's Eastland Restaurant, Detroit, Michigan.



Sinks and countertops of stainless steel in the Abbott Laboratories, Oak Ridge, Tennessee. Its ease of cleaning and high corrosion-resistance make stainless steel ideal for "Hot-Lab" installations.

STAINLESS STEEL...

. . . THE METAL OF NEW IDEAS

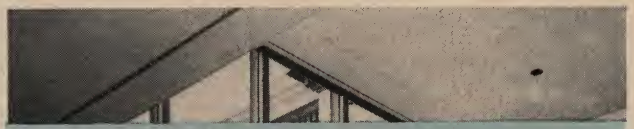
Presented here are details of several interesting applications for stainless, suggesting that resourceful architects will constantly discover new ideas for stainless. Stainless helps make the architect's work easier for it offers unlimited opportunity in architectural design because of its wide versatility.

Use of stainless in marquee, railings and facade distinguish the handsome home of American Hardware Mutual Insurance Company, Minneapolis, Minnesota. Architects: Thorshov and Cerny; Fabricator: Crown Iron Works Co.

Stainless cross being hoisted atop St. Olaf's Church, Minneapolis, Minn. Architects: Thorshov and Cerny, Minneapolis, Minn.; General Contractor: McGough Brothers, St. Paul, Minn.

Stainless baggage delivery racks and shelving at Cleveland Air Terminal. Architects: Outcalt Guenther and Associates; Fabricator: Franck and Fric Company.

Lastingly beautiful stainless steel posts with chain. Belli and Belli Company, Architects and Engineers.



The Cleveland Museum of Art Classical Gallery seen from the terrace. All visible metal in doors and windows is stainless for maximum weather protection.

Stainless steel windows and doors in Classical Gallery of Cleveland Museum of Art. Architects: Hays and Ruth; Fabricator: Flour City Ornamental Iron Works, Minneapolis, Minnesota.

STAINLESS STEEL . . .

CURTAIN WALL

Morton Salt Company Office Building, Chicago, Illinois. Stainless steel reversible windows and stainless curtain wall. Architects and Engineers: Graham, Anderson, Probst and White, Inc.; General Contractor: Sherman Olson, Inc.

The 45-story stainless steel clad Socony-Mobil Building at Lexington Avenue and 42nd Street, New York, N. Y.—the world's largest metal clad building. Owner: Galbreath Corporation. Architects: Harrison & Abramovitz. Associate Architect: John B. Peterkin. Builder: Turner Construction Company.

Miami Beach Federal Building, Miami, Florida. Curtain wall construction with Republic stainless steel reversible windows and stainless trim with porcelain enamel panels. Architects and Engineers: Edwin T. Reeder Associates; Contractors: Arkin Construction Company.

Prefabricated metal-clad curtain wall panels have been widely used for both single and multi-story buildings. They can be made in a variety of sizes and designs, depending on the particular requirements of the job.

Stainless offers superior corrosion-resistance which results in lower maintenance costs for curtain wall construction. No special surface treatment is required to enhance its corrosion-resistance and it maintains a bright new appearance for the lifetime of the building with a minimum of cleaning.

SPECIAL ADVANTAGES

- Stainless offers superior fire-resistance as its melting point is considerably higher than most nonferrous metals.

- The inherent strength of stainless steel means that building panel components fabricated in the shop will be less likely to become dented or damaged when shipped to the job site or when under erection.

- Stainless is easy to weld and perfect blending of the weld and surrounding areas is readily done with a minimum of work.

COLORED AND TEXTURED

STAINLESS STEEL CURTAIN WALL

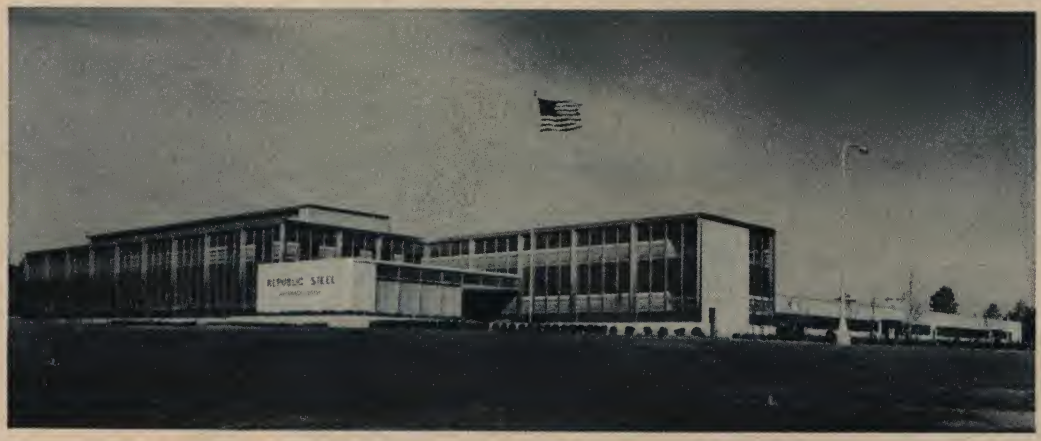
Viewed from even a moderate distance, the geometric design of the radically new patterned and porcelainized stainless steel curtain wall on the new Republic Steel Research Center appears to have a uniform, unbroken tone—similar to the effect of the myriad dots which make up the solid tints and shades of half-tones.

The stainless steel used on the curtain wall panels of Republic Steel's new Research Center is embossed with a special pattern and provided with a "two-tone" finish of blue porcelain enamel and shining metal. This finish was produced by first coating the entire sheet with a porcelain enamel frit, then wiping the enamel from the raised areas to expose the stainless prior to firing. After firing, the exposed stainless areas were polished, resulting in an impressive pattern of high spots of polished stainless against a glossy background.

Optical distortion, most obvious in large flat areas, can be controlled by minimizing flat areas or by using heavier material or by providing stiffeners

Close-up view of a section of the patterned stainless steel shows the design created and rolled into the metal.

General view of the new Republic Steel Research Center in Independence, Ohio, finds the patterned stainless sheets—above and below the windows—assuming an over-all tone of blue.



for lighter panels. Recommended practices for size, gage and finish of stainless panels and stiffener ribs and support spacing is available from published sources.

For the Republic Research Center, 272 stainless steel panels were used for the exterior; another 18 panels for the cafeteria. The panels are 4 ft. wide and are of three different heights—2½ ft., 3 ft. and 7 ft. The stainless sheet employed was 20 gage, Type 304, with a 2-B finish.

Colored and textured stainless open up new fields for curtain wall architecture. There are 30 different standard porcelain colors available. This color choice is multiplied many times by the various shades and tints possible by combination of these standard colors. In addition, there are at least 50 different rolled design patterns that may be selected. Textured stainless sheet is considerably stronger than ordinary sheet and lighter gages can be employed having equivalent stiffness and strength.

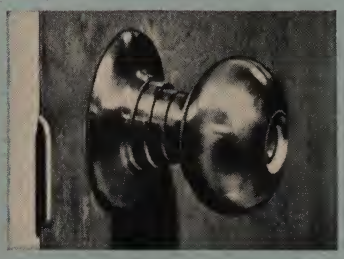
The market for textured stainless steel includes such product applications as curtain walls; surfacings for building foyers, elevators, kitchens, cafeterias, store interiors and store fronts; ornamental uses of many kinds, including wainscoting; numerous "scuff resistant" uses, such as bus seat backs, revolving doors, stair treads, walkways, subway wainscoting, counter fronts.

miscellaneous applications of stainless

Each year marks an increase in the architectural use of stainless steel. Architects and designers find it the answer to many of their design problems for both interior and exterior applications. In outdoor applications, stainless has proven to be impervious to weather. Installations made over 30 years ago are in perfect condition today and there is every indication that they will remain that way indefinitely.

For interior use, the gleaming lustre of stainless steel adds a note of luxury to any type of installation. Its tough, hard surface resists scratching and marring and its handsome appearance is easy to maintain in a like-new condition.

Stainless steel gutters and downspouts are manufactured by Republic Steel's Berger Division from Type 301 in several styles. Roof drainage products of stainless steel are highly resistant to corrosion and are the most durable and long lasting.



Exterior lockset of stainless will always stay bright and attractive.

Stainless steel has long been the favorite material for sign makers. It is readily fabricated and has a very high strength to weight ratio however, its enduring beauty is the chief reason for its popularity in sign work.

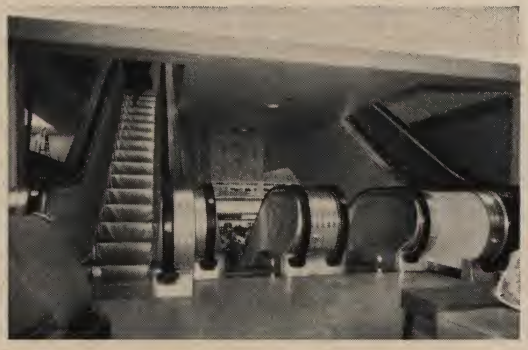
Railings of stainless steel add a luxurious note to the finest interiors. Their hard abrasion resisting surface and gleaming luster that requires little maintenance make them the first choice for public buildings where service is severe.

Door hinges of tough, gleaming stainless.

STAINLESS STEEL REVERSIBLE WINDOWS

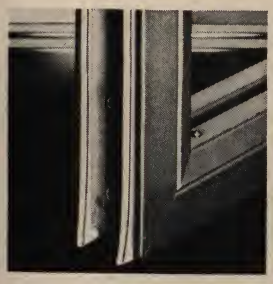
Modern, completely air conditioned, fireproof buildings should have an anticipated acceptable tenant life of 100 years. Here's a window with that life expectancy. The highest quality product ever offered to architects and owners.

Republic's Truscon Reversible Window is fabricated of Type 302 stainless steel that resists rust and corrosion and is almost immune to weather. It never needs costly painting or steam cleaning. An occasional detergent or soap and water wash will restore its original beauty for the life of the building.



Moving stairways in stainless look more attractive and take severe service without denting or scuffing.

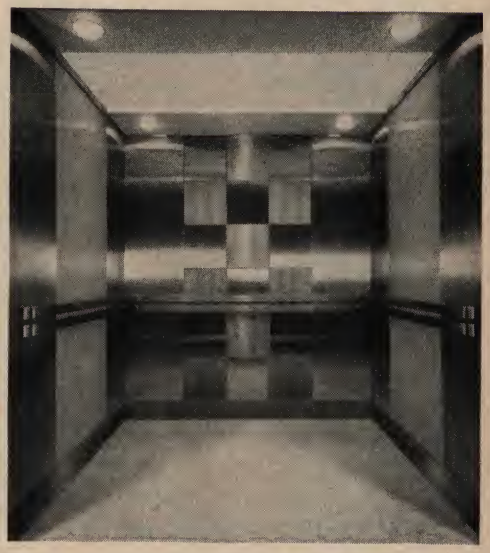
Stainless steel is the perfect metal for capping and flashing—corrosion-resistant, it will never bleed and discolor adjacent stonework or other material.



Double gasketing of polyvinyl chloride prevents leakage of heated or cooled air and provides an estimated annual savings of $4.25 per opening over conventional windows in a fully air conditioned building.

Rotates full 360° to permit washing from inside and cut cleaning costs by 50%.

Although window is designed for fully air conditioned buildings this hold open arm is provided to hold ventilator 3 inches open should air conditioning fail. For safety, the ventilator can only be opened by a special key and is automatically locked when in closed position.



Elevator cab showing variety of stainless steel finish achieved by sandblasting and special treatments. Manufactured by The W. S. Tyler Company, Cleveland, Ohio.

As may be seen from these pictures, stainless Types 303 or 430F fastenings are available in many types for various purposes. It is essential that only stainless fastenings be used with stainless installations to avoid rusting and contamination of the stainless.

REPUBLIC STEEL

Stainless steel may be given various decorative treatments

TEXTURED STAINLESS

Interior uses of textured stainless is becoming increasingly popular. Texturing is a rolling process which embosses a pattern into metal. Type 302 textured sheets have greater rigidity than flat metal, greater strength, and greater resistance to denting. Textured surfaces also conceal scratches and finger marks and discourage "doodlers."

SCULPTURED STAINLESS

The possibilities of using stainless for varied decorative effects are almost limitless. The sculptured figure shown at right is a little over 2¼ feet in length. Circles are formed from bars and figure is produced from sheet by repousse method. Figure is permanently blackened for contrast and artistic effect.

QUILTED STAINLESS

Another special treatment of stainless is a brake formed design known as "quilted pattern." "Quilting" can be done in any sheet metal shop on a standard brake press. The pattern adds variety to large areas and imparts a rich, attractive appearance.

Twin Coach Inn, near Pittsburgh, Pennsylvania. Fabricator: Allied Refrigeration Co., Pittsburgh. Textured stainless steel used in one of many designs available for bar facing.

Ornamental medallion, Ohio Oil Company Building, Findlay, Ohio. Fabricator: Rose Iron Works, Cleveland, Ohio. Architectural ornament and letters made of stainless steel.

The Corner Hut, Chicago, Illinois. Here an unusual effect has been obtained by giving a quilted pattern to 26-gage, No. 4 Finish, Type 302.

ETCHED STAINLESS

Stainless may be etched to obtain a rich-looking effect. It may also be etched and filled in with color, either in solid tones or in air brush effects. It also can be Tampico brushed to produce a striped pattern.

Elevator doors, Daniels and Fisher Store, Denver, Colorado. Elevator doors with etched pattern are typical of this kind of decorative trim.

SHEET FINISHES . . .

No. 1 Finish should be used whenever a great amount of forming is necessary. It is also applicable at points where appearance is not a primary factor but where corrosion-resistance is important, such as mail chutes, tanks, tubing and a variety of other uses.

No. 2B Finish and No. 2D Finish are similar to No. 1 except that they have a better finish and smoother surface due to cold roll processing.

No. 3 Finish is a ground finish somewhat coarser than No. 4 Finish and used for similar exterior and interior applications.

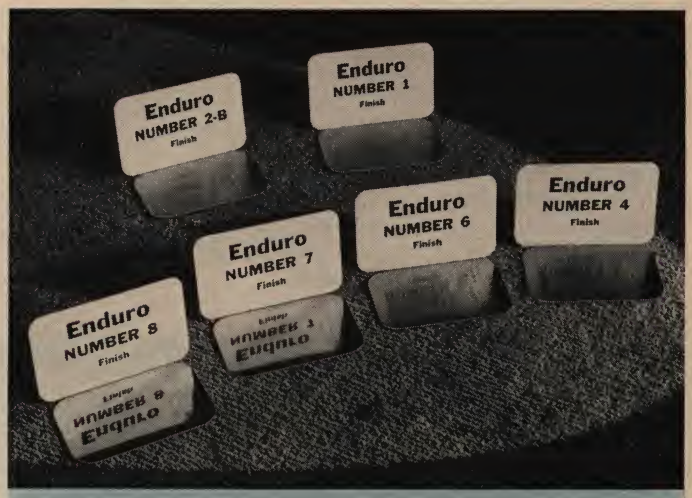
No. 4 Finish is ground and mechanically polished and is very popular for exterior and interior architectural applications. It possesses a ground surface appearance with a medium lustre and is the finish recommended for most architectural uses.

No. 6 Finish has a silvery lustre and has much lower reflectivity than No. 4. It can often be used to blend with finishes of higher lustre or with other metals. Higher lustre finishes, such as No. 7, are obtainable and are similar to No. 4 with the exception that the lustre obtained by buffing is much brighter.

No. 8 Finish is the highest obtainable finish in commercial steel practice. All of the grinding lines are removed and a sheet of high reflectivity is obtained. Little need exists for this finish in architectural applications.

STAINLESS FINISHES . . .

Stainless steel is available in a number of different finishes, selected for desired effects. At the same time, there are limitations on the type of finish which should be specified for any given application. For example, it is inadvisable to use polished sheets for extra deep drawing operations where score marks from dies are likely to occur or where it is necessary to anneal for a second drawing operation. Of course, in such cases, polishing could be done after fabrication. Republic Steel Corporation and its distributors will be glad to advise on the selection of proper finish.



The various sheet finishes are designated as follows:

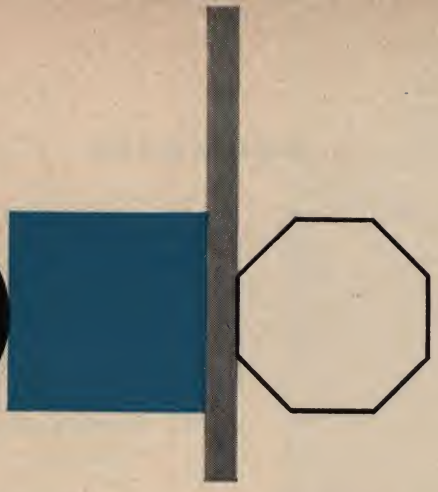
No. 1—hot rolled, annealed, and pickled.
No. 2-B—full finish (bright cold rolled).
No. 2-D—full finish (dull cold rolled).
No. 3—intermediate finish on one or both sides.
No. 4—standard finish on one or both sides.
No. 6—standard finish, Tampico brushed on one or both sides.
No. 7—high lustre finish on one or both sides.
No. 8—mirror finish on one or both sides.

STRIP FINISHES . . .

The finishes of stainless steel cold rolled strip are designated as follows:

No. 1—cold rolled, annealed, and pickled.
No. 2—cold rolled, annealed, pickled, and rerolled.

STAINLESS FORMS



Stainless steel is furnished as listed below.

All shapes are produced by forming, rolling, or drawing. For detailed information, consult any of the Republic Sales Offices listed on the back cover.

- rounds—hot rolled, cold drawn, centerless ground, polished.
- squares—hot rolled or cold drawn.
- hexagons—hot rolled or cold drawn.
- flats—hot rolled or cold drawn.
- special shapes—on application.
- strip—cold rolled.
- plates—practically any size and thickness obtainable in plain steel.
- sheets—standard gages and sizes, annealed and pickled, cold-rolled, polished one side and polished both sides.
- forging billets.
- structural shapes.
- tubing—seamless and Republic ELECTRUNITE® electrically welded. Bright annealed or polished.
- welding rods—uncoated rods for electric and acetylene welding. Coated rods may be obtained from warehouse or jobber.
- castings—Republic does not produce stainless castings. However, they are readily available from a number of responsible foundries.
- fastenings—bolts, nuts, rivets, screws, nails, tacks, spikes, wire and many other items of stainless steel can be obtained from various sources. Names of manufacturers will be gladly furnished.

ROOF DRAINAGE PRODUCTS . . .

Whether you're designing an institution or a private dwelling, stainless steel roof drainage products will provide the answer to trouble-free service and long-run economy. Fabricated by Republic's Berger Division, these items are made of Type 301, 28 gage (.015″) stainless in dull finish.

Stainless steel under normal conditions will last the lifetime of the building. Maintenance is negligible for stainless does not bleed or discolor paint. The finish of these products blends with any style or color scheme, but, if desired, they may be painted. Stronger than similar products of ordinary steel or other metals or materials, they are able to withstand heavy loads of wind, snow and ice.

The high strength-weight ratio of stainless steel provides an added advantage in that it permits working with extremely long sections. This means less handling, fewer joints and reduced installation costs.

Stainless roof drainage products are available in round, round corrugated, and square corrugated conductor pipe in varoius sizes; also "K" gutters, eaves trough, and a complete assortment of fittings.

STAINLESS TUBING AND PIPE . . .

ELECTRUNITE Stainless Steel Tubing is available in sizes ranging from ¼″ O.D. to 5″ O.D. and in various analyses, finishes and gages. Sizes from 5″ O.D. to 40″ O.D., also in various analyses, finishes and gages, will be furnished upon request.

ELECTRUNITE Stainless Steel Pipe is available from ⅛″ I.P.S. through 2″ I.P.S. in A.S.A. schedule 40S; from ⅛″ I.P.S. through 4″ I.P.S. in schedule 10S; and from ½″ I.P.S. through 4″ I.P.S. in schedule 5S wall thicknesses. Larger sizes in various analyses and finishes will be furnished upon request.

For further information, write Steel and Tubes Division, Republic Steel Corporation, Cleveland 8, Ohio.

REPUBLIC GALVANIZED SHEETS

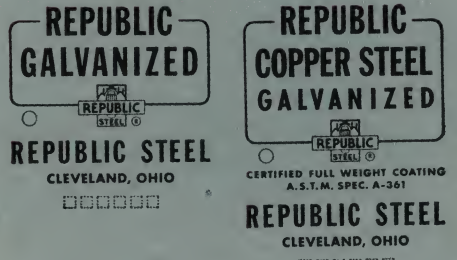
Republic Galvanized Sheets are available in two different types of base steels:

1. A high-grade open hearth steel, and
2. Republic Copper Steel, a type with 0.20 to 0.30% copper added to improve corrosion-resistance.

Republic's regular galvanized sheets, made from a high-grade open hearth steel, then galvanized for best corrosion-resistance, are satisfactory for many applications. Included are blower ducts, cabinets, clothes chutes and dryers, heating and ventilating ducts, metal boxes, radiator shields, smoke pipe, and many others.

For applications requiring more corrosion-resistance, Republic Copper Steel Sheets are recommended. Tests have shown that uncoated copper steel sheets outlast regular uncoated sheets as much as 2 to 2½ times. This inherent characteristic, plus the added protection of zinc, makes these sheets suitable for specifications requiring top quality.

Republic galvanized sheets are identified by the stencils shown at right. Jobbers in all large cities stock these quality products.



These stencils readily identify Republic galvanized sheet products. The series of dotted-line boxes beneath each stencil represents the spaces which, in actual practice, would show the heat number. Full control over the product from melt to finished product is possible by keeping a careful record of each heat as it is processed through the mill.

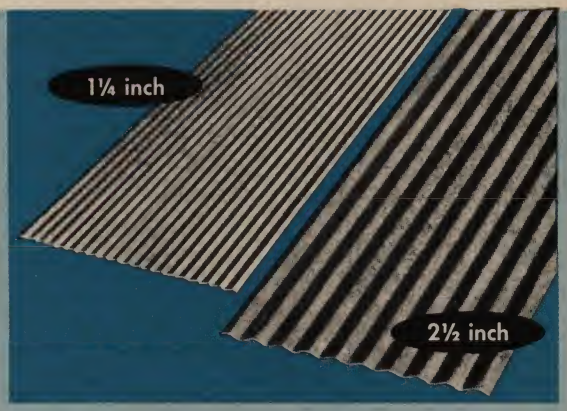
REPUBLIC TRIPLE DRAIN
REPUBLIC STEEL
Close-up view showing over-lapping of sheets with perfected Triple Drain construction.

REPUBLIC TRIPLE DRAIN ROOFING

1. Water or dust does not remain on flat top to start chemical reaction.
2. Painted nailing guide lines show where to drive nails.
3. Center crimp gives added longitudinal rigidity, prevents sagging or buckling.
4. Guide for top lap guarantees a snug fit throughout entire length of sheet.
5. Wind deflector guards against buckling and prevents any capillary action of water.
6. Rib stiffeners across sheet eliminate wind flapping and stop syphoning.
7. Steep "V" channels drain off water faster, keeping them clean, free of dust or chaff.
8. Nail channel prevents slipping, crooked driving, damage to sheet.

accessories for use with triple drain roofing

Adjustable Ridge Roll, End Wall Flashing, Gambrel Roof Joint, Overhang Eaves Drip, Gable End Starter, Gable End Finisher, and Flared Eave Joint. Available only in 26, 28, and 29 gage. Furnished in plain galvanized steel or steel.



REPUBLIC ROOFING AND SIDING

Ridge Roll — Plain. Corrugated — Plain, with or without nailing flange; length 10 ft.; roll sizes, 1, 2, 2¼ inches; apron size 2 to 3 inches. Girths 12, 14, 16, and 18 inches; 24 gage and lighter.

Corrugated Sheets — Light but rigid; good fire protection. In 1¼" style, 24 gage and lighter; 2½" style, 18 gage and lighter. Covering width 24" (standard widths 26" and 27½"). Lengths: 6, 7, 8, 9, 10, 11, and 12 ft.

REPUBLIC ELECTRO PAINTLOK SHEETS

produced the modern way through electroplating . . .

Republic Electro Paintlok Sheets are galvanized by the Electrolytic process that deposits an accurately controlled layer of pure zinc on a cold rolled base metal. They are then chemically treated to provide an inert, finely crystalline, non-metallic phosphate coating that is integral with the zinc and highly absorbent in character.

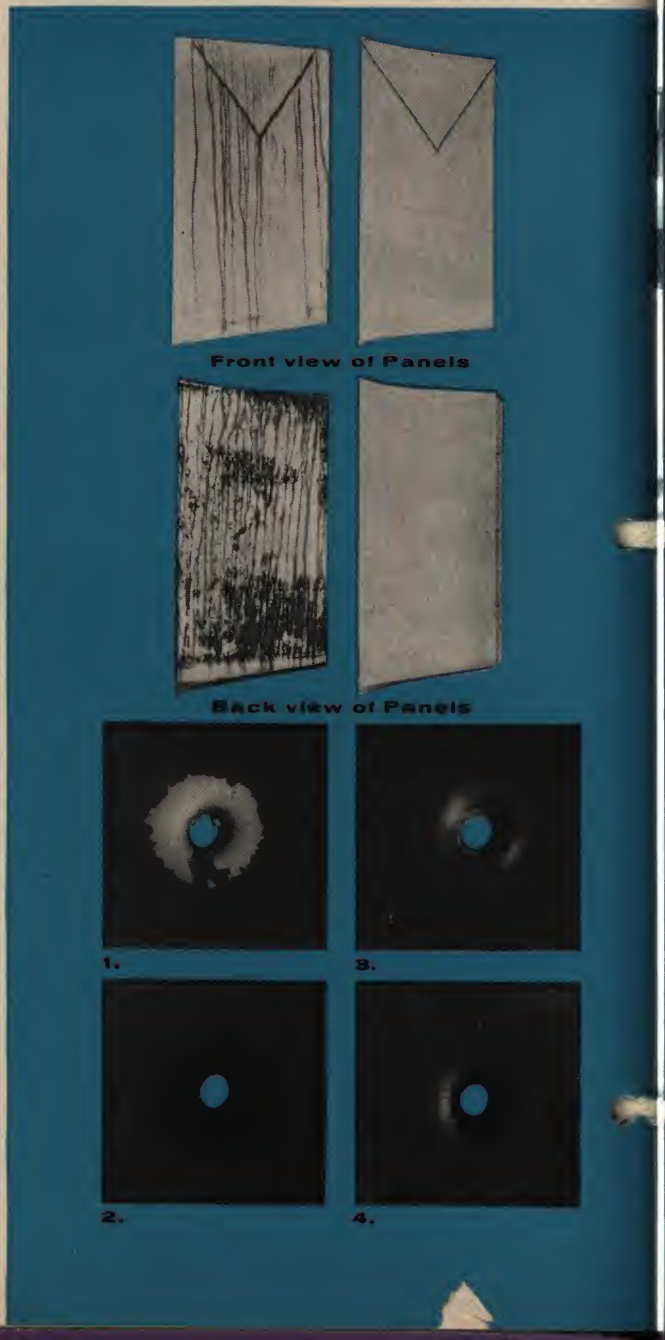
offer longer life for architectural products through . . .

MAXIMUM PAINT ADHERENCE: The Electro Paintlok coating grips the paint with thousands of tiny "teeth" that never let go.

RESISTANCE TO CORROSION: Electrogalvanizing, combined with special paint-bonding chemical treatment effectively retards corrosion when the painted surface is scratched or otherwise abraded. Creeping of corrosive elements underneath the paint from the point of damage is also minimized.

Tested and Proved

Sprayed with a 20 percent salt solution for 72 hours at 90° F. after a V-shaped scratch was made in the enamel, stove panels of ordinary cold rolled steel (left) and of Electro Paintlok (right) appeared as shown at right, clearly demonstrating the remarkable ability of Electro Paintlok to resist rust and the creeping of corrosive elements from point of damage under painted surface.



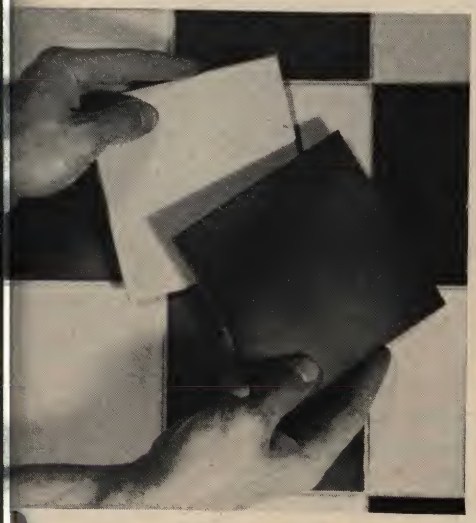
Here's proof:

Given the "bullet test," samples of ordinary hot dipped galvanized sheets and Republic Electro Paintlok Sheets appeared as in the unretouched photos at right. No. 1 is hot dipped galvanized specimen immediately after being pierced by the bullet. Note how paint has cracked off in a wide area around hole. No. 2 is the same sheet after three months exposure to the weather. Nos. 3 and 4 are Electro Paintlok specimens given the same treatment.

Applications

Electro Paintlok Sheets are recommended as especially suited for sheet metal applications which are to be subsequently painted. Typical applications include: ventilating ducts, garage doors, cabinets of all kinds, kitchen range hoods, venetian blinds, signs, marquees, clothes chutes, metal partitions, radiator shields, reflectors, refrigerator equipment, wall and partition panels for gas stations, dispensaries, clinics, restaurants, stores, etc.

In short, any sheet metal product that is normally painted is a perfect application for these sheets. They are not to be used, however, for gutters, downspouts, roofing, or other exposed purposes. For the most part, exterior applications are ones where prefabricated, synthetic enameled panels are used.

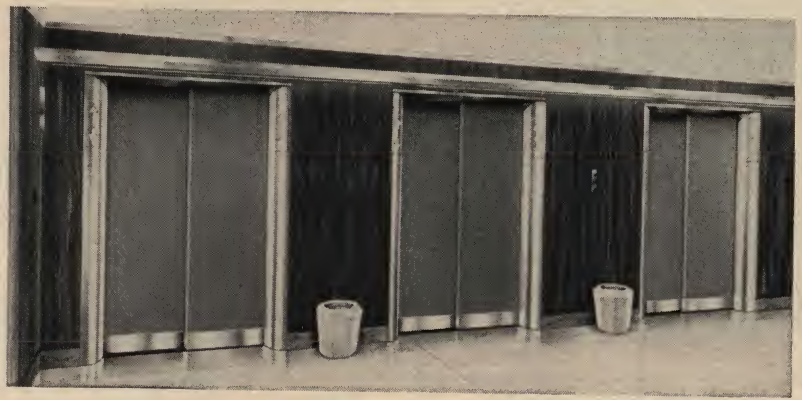


Electro Paintlok wall tile with a lustrous and durable synthetic enamel finish manufactured by Duratile Corporation, Mishawaka, Indiana.

Superior weather resistance, attractive appearance and long life are important features of these handsome garage doors made from Republic Electro Paintlok.

Installing acoustical ceiling pans. These pans, made of Electro Paintlok, measure 12 inches by 24 inches. They are perforated, insulated, and made to fit into "T" rails installed across ceiling. Paint adherence and color uniformity are particularly important in this type of application.

National Gypsum Co. Office, Buffalo, New York. Architects: Backus, Crane, and Love, Buffalo.

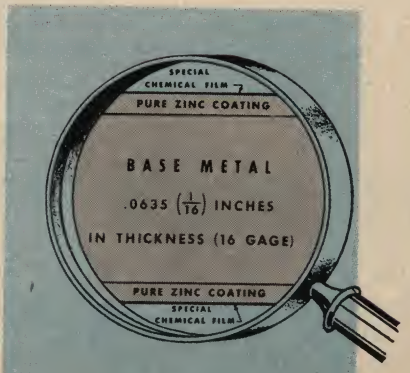


Elevator doors and panels of Electro Paintlok. The ease of finishing Electro Paintlok is very important in grained panels such as these. This difficult finish is applied by hand.

REPUBLIC STEEL

Gages and sizes

Electro Paintlok Sheets are available in thicknesses from .0090 to .1083 inches and in widths to 60" and cut lengths to 156", depending upon thickness.



sales offices

In order to give efficient service to users of its steel products, Republic maintains sales offices in principal cities. Specially trained men in these offices are prepared to offer competent technical advice. A phone call will bring a Republic representative ready to discuss any problem or to give complete information on all products.

Birmingham 13, Alabama
Boston 16, Mass.
Buffalo 3, New York
Chicago 4, Illinois
Cincinnati 2, Ohio
Cleveland 1, Ohio
Dallas 1, Texas
Dayton 2, Ohio
Denver 2, Colorado

New Orleans 12, La.
New York 17, N.Y.
Philadelphia 3, Pa.
Pittsburgh 22, Pa.
St. Louis 3, Mo.
St. Paul 1, Minn.
San Francisco 5, Calif.
Seattle 1, Wash.
Syracuse 2, N. Y.

Detroit 2, Michigan
East Hartford 8, Conn.
Grand Rapids 2, Mich.
Houston 2, Texas
Jacksonville 2, Fla.
Kansas City 5, Mo.
Los Angeles 17, Calif.
Louisville 2, Ky.
Milwaukee 2, Wisc.

Tulsa 3, Okla.
Warren, Ohio
(Youngstown District)

CANADIAN SALES:
Ontario Representative,
Commerce and Transportation
Building, Toronto, Ontario

EXPORT DEPARTMENT,
New York 17, N. Y., U. S. A.
CABLE ADDRESS "TONCAN"

For information on additional Republic products also see Sweet's Files as follows:

	Product Design	Plant Engineering	Architectural	Light Construction
Berger Division			8g/Re, 23d/Re	
Republic Steel	1a/Re		6c/Re, 29a/Rep	
Steel & Tubes Division	1e/Rep	2d/Rep	2f/Re, 32b/Re	
Truscon Division			2f/Tr, 12a/Tr 16b/Trs, 16h/Tr, 17b/Tr, 3d/Tr, 17a/Tru	6b/Tr

REPUBLIC STEEL

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